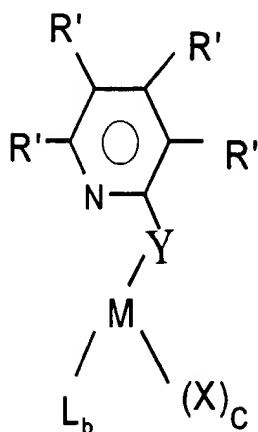
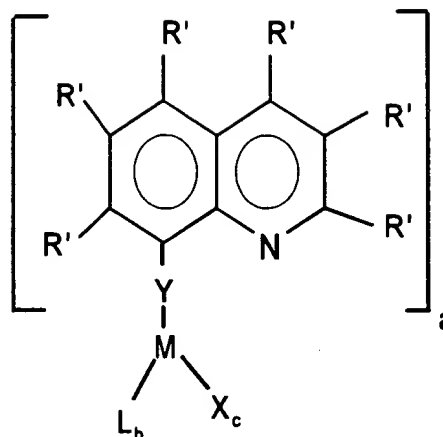


WE CLAIM:

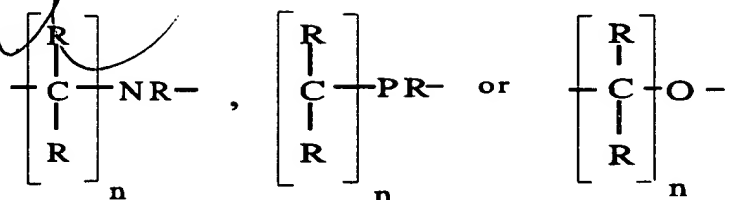
1. A catalyst having the general formula



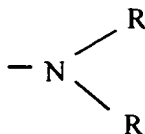
or



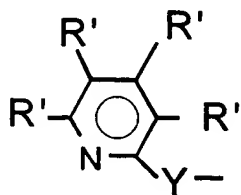
where Y is O, S, NR, PR,



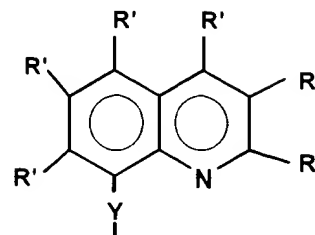
each R is independently selected from hydrogen or C₁ to C₆ alkyl or C₆ to C₁₄ aryl,
each R' is independently selected from R, C₁ to C₆ alkoxy, C₇ to C₂₀ alkaryl, C₇ to C₂₀
aralkyl, halogen, or CF₃, M is a Group 3 to 10 metal, each X is independently
selected from halogen, C₁ to C₆ alkyl, C₆ to C₁₄ aryl, C₇ to C₂₀ alkaryl, C₇ to C₂₀
aralkyl, C₁ to C₆ alkoxy, or



L is X, cyclopentadienyl, C₁ to C₆ alkyl substituted cyclopentadienyl, indenyl, fluorenyl, or



or



"n" is 1 to 4;

"a" is 1 to 3;

"b" is 0 to 2;

$a + b \leq 3$;

"c" is 1 to 6; and

$a + b + c$ equals the oxidation state of M

2. A catalyst according to Claim 1, wherein $a + b \leq 2$ when the oxidation state of M is 4 or less and $a + b \leq 3$ when the oxidation state of M is greater than 4.

3. A catalyst according to Claim 2, wherein $a + b \leq 2$ when the oxidation state of M is greater than 4.

4. A catalyst according to Claim 1, wherein Y is oxygen.

5. A catalyst according to Claim 1, wherein X is halogen.

3

6. A catalyst according to Claim 5, wherein X is chlorine.

1

7. A catalyst according to Claim 1, wherein M is a Group 3 to 7 metal.

1

8. A catalyst according to Claim 7, wherein M is a Group 4, 5 or 6 metal.

1

9. A catalyst according to Claim 8, wherein Y is oxygen.

10. A catalyst according to Claim 8, wherein M is titanium, zirconium or hafnium.

11. A catalyst according to Claim 10, wherein M is titanium or zirconium.

12. A catalyst according to Claim 11, wherein Y is oxygen.

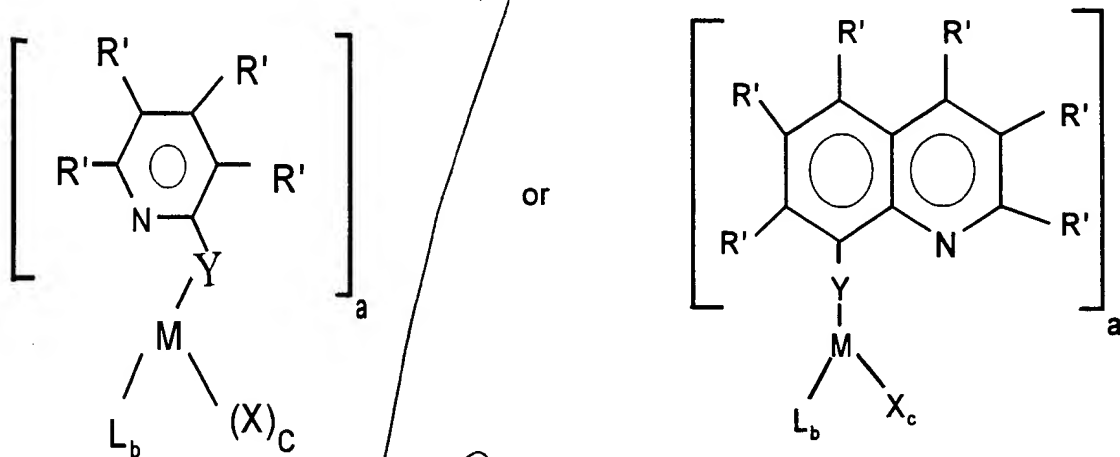
1

13. A catalyst according to Claim 11, wherein X is halogen.

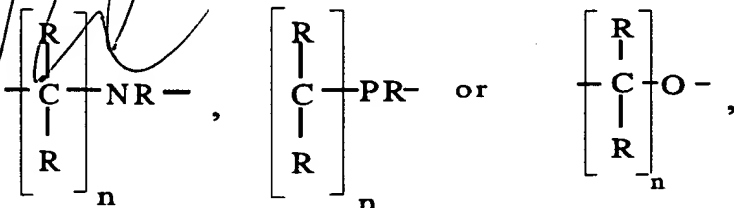
1

14. A catalyst according to Claim 12, wherein X is chlorine.

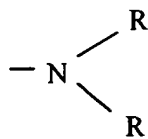
15. A method of making a poly- α -olefin comprising polymerizing an α -olefin monomer using a catalyst that has the general formula



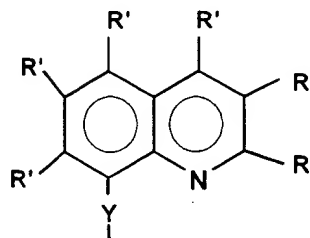
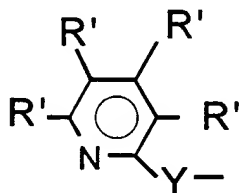
where Y is O, S, NR,



each R is independently selected from hydrogen, C₁ to C₆ alkyl, C₆ to C₁₄ aryl, each R' is independently selected from R, C₁ to C₆ alkoxy, C₇ to C₂₀ alkaryl, C₇ to C₂₀ aralkyl, halogen, or CF₃, M is a Group 3 to 10 metal, each X is independently selected from halogen, C₁ to C₆ alkyl, C₆ to C₁₄ aryl, C₇ to C₂₀ alkaryl, C₇ to C₂₀ aralkyl, C₁ to C₆ alkoxy, or



10 L is X, cyclopentadienyl, C₁ to C₆ alkyl substituted cyclopentadienyl, indenyl,
11 fluorenyl, or



12 "n" is 1 to 4;

13 "a" is 1 to 3;

14 "b" is 0 to 2;

15 $a + b \leq 3$;

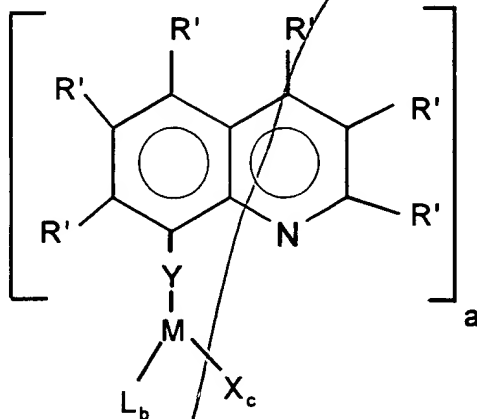
16 "c" is 1 to 6; and

17 $a + b + c$ equals the oxidation state of M.

a

1 16. A method according to Claim 15, wherein said catalyst has the general
2 formula

- 1 17. A catalyst according to Claim 16, wherein $a + b \leq 2$ when the oxidation state
2 of M is 4 or less and $a + b \leq 3$ when the oxidation state of M is greater than 4.



- 1 18. A catalyst according to Claim 17, wherein $a + b \leq 2$ when the oxidation state
2 of M is greater than 4.

- 1 19. A method according to Claim 17, wherein Y is oxygen.

- 1 20. A method according to Claim 16, wherein M is a Group 4 to 6 metal.

add
a³

add
B¹